In re Patent Application of:
DOUGHERTY ET AL
Serial No. **10/629,143**
Filed: **JULY 29, 2003**

IN THE CLAIMS

Claim 1 (currently amended): A planar optical waveguide tap, in which ~~substantially absent of~~ polarization dependent loss is substantially compensated from an input end to an output end, comprising:

a first optical waveguide for supporting a first polarization mode and a second polarization mode when light is launched into the input end of said waveguide;

a second optical waveguide having at least a coupling portion adjacent and proximate to the first optical waveguide for receiving a portion of light launched into the first optical waveguide into the second optical waveguide, said coupling portion ~~inherently~~ coupling light in a substantially polarization dependent manner, such that the first polarization mode couples significantly more strongly than the second polarization mode into the second optical waveguide from the first optical waveguide, so that light of the second polarization received into the second optical waveguide from the first optical waveguide experiences higher optical loss through said coupling portion than light of said first polarization mode; and[,]

a bend portion of the second optical waveguide distinct from the coupling portion and positioned between the coupling portion and the output end, said bend portion having at least one predetermined bend therein for transmitting light therethrough in a substantially polarization dependent manner, ~~which allows~~ so that light of the first polarization mode ~~to~~ radiates out of the bend portion of the waveguide into a cladding about the bend portion with greater efficiency, and therefore experiences higher optical loss in the bend, than light of the second polarization mode, so to substantially ~~effectively nulling~~ compensate for a polarization ~~dependence~~ dependent loss that occurs from the

coupling portion~~,~~ for light which remains with the second optical waveguide after passing through the bend portion ~~exiting the output end~~.

Claim 2 (currently amended) A planar optical waveguide system, including a first optical waveguide for supporting a first polarization mode and a second polarization mode and having a second optical waveguide including at least a coupling portion adjacent and proximate to the first optical waveguide for tapping a portion of light launched into the first optical waveguide into the second optical waveguide, wherein in operation, the first polarization mode of the light that has coupled into the second optical waveguide from the first optical waveguide experiences an insertion loss I_{I1}, substantially less than the insertion loss, I_{I2}, of light in the second polarization mode coupled into the second optical waveguide, wherein an insertion loss difference $I_\Delta = I_{21} - I_{I1}$, with $I_\Delta > 0$, exists, the improvement comprising:

a portion of the second optical waveguide having at least one bend therein for transmitting light therethrough in a substantially polarization dependent manner, ~~thereby~~ a respective bend causing light in the first polarization mode[,] to radiate out a core of said respective bend ~~portion~~ with greater efficiency, and thereby experience higher optical loss in the respective bend, than light in the second polarization mode, so as to substantially ~~null~~ compensate for the insertion loss difference I_Δ for light coupled from the first optical waveguide to the second optical waveguide after passing through said respective bend thereof.

Claim 3 (currently amended): A polarization compensated planar waveguide branch comprising:

a planar optical trunk waveguide for transporting an ~~linearly un-polarized~~ optical signal having TE and TM modes; and

a planar optical branch waveguide, capable of supporting TE and TM modes, optically coupled to the trunk waveguide, such that at least a portion of an optical signal propagating within the trunk waveguide will couple into the branch waveguide with a coupling [an] imbalance between said TE and TM modes, ~~having~~ causing stronger TM mode coupling than TE mode coupling, and thereby higher optical loss for the TE mode than for the TM mode, for the at least the portion of the optical signal which couples into the branch waveguide from the trunk waveguide;

wherein a portion of said branch waveguide downstream from a region where coupling takes place between the trunk and branch waveguides, or a waveguide portion optically coupled thereto for receiving the at least a portion of the optical signal, has ~~at least~~ a predetermined bend with a predetermined radius for transmitting light therethrough in a substantially polarization dependent manner, so as to cause higher optical loss in the predetermined bend for the TM mode than for the TE mode, thereby compensating for said coupling ~~an~~ imbalance between said TE and TM modes ~~in the TM and TE mode caused by light optically coupling into the branch from the trunk waveguide~~.

Claim 4 (currently amended) In a chip for transporting a plurality of optical signals having a plurality of separate trunk waveguides within a ~~same~~ common substrate, each having a branch waveguide optically coupled thereto by a separate coupling regions, each ~~optical coupling at each~~ coupling region ~~inducing~~ exhibiting an imbalance in TE and TM mode coupling, thereby inducing a polarization dependent loss for light coupl~~inged~~ from each trunk to a respective branch waveguide[;], the improvement comprising:

each branch waveguide ~~having~~ includes a waveguide region that is downstream from said coupling region, said waveguide region having at least a predetermined bend therein, for transmitting light therethrough in a substantially polarization dependent manner, and offsetting and compensating for said imbalance ~~to effectively null said~~ in TE and TM mode coupling, to realize light transmission from said trunk waveguide to said

branch waveguide passing through said bend with a substantially reduced resultant or net polarization dependent loss~~imbalance in TE and TM modes~~.